

No. 9.— *A New Peripatus from Colombia*.¹

BY CHARLES T. BRUES.

THE Bryant Walker Expedition, of the University of Michigan, which visited the Sierra Nevada de Santa Marta in northeastern Colombia during the summer of 1913, obtained an interesting series of Onychophora. Through the kindness of Dr. A. G. Ruthven, the leader of the Expedition, I have had the opportunity of examining these specimens which were collected by himself and Prof. A. S. Pearse. Professor Pearse made some valuable field notes at the time the animals were obtained, and these are of such interest, that they are included separately at the end of the taxonomic account.

Three species are represented in the collection, *P. edwardsii* and *P. inthurmi* in addition to the one described as new. All belong to Bouvier's (Monographie des onychophores, 1907, p. 158) group of "Péripates caraïbes" which has lately been given the subgeneric name of *Epiperipatus* by Clark (Proc. Biol. soc. Washington, 1913, 26, p. 17). It may be mentioned, however, that Bouvier's division of the neotropical forms into Andicolous and Caribbean species does not hold for the Colombian species as has recently been shown by Fuhrmann (Zool. anz., 1913, 42, p. 242).

PERIPATUS (EPIPERIPATUS) VESPUCCII, sp. nov.

Plate 1, fig. 1-4; Plate 2, fig. 7.

A small, moderately slender species with 33 or 34 pairs of legs in the female and 30 pairs in the male. Integument similar to that of *P. brasiliensis*, but there are two incomplete folds on each body segment.

Form and dimensions. Body rather slender, considerably narrowed at each end, so that it tapers very decidedly from a broadened middle portion toward the head and posterior end. In the three specimens before me, the body measurements are as follows:—

¹ Contributions from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 81.

TABLE 1.

Length of body		Greatest breadth	Number of legs
Type ♀	32 mm.	5 mm.	34 pairs
Paratype ♀	36 mm.	5 mm.	33 pairs
Paratype ♂	21 mm.	4 mm.	30 pairs

Although there is a difference in proportions in the two females the paratype is more fully expanded and consequently appears to be of a more slender form. The type female and the male are of very similar shape (see Plate 2, fig. 11).

Coloration. All three specimens are considerably decolorized from their preservation in alcohol, but still show very distinctly the general color-pattern of the body. To the naked eye, the legs and a broad stripe directly above them are much lighter than the dorsal region, exhibiting a dull yellowish gray tint with distinct purplish cast which is much more distinct in one specimen. In all three, the legs are decidedly paler than the pleural stripe. The dorsal region, including two thirds of the animal when seen from above, is much darker than the pleurae and differentiated into a complicated color-pattern. This consists in a light-colored median dorsal broad stripe, strongly constricted between each body segment, and a narrow very dark beaded or interrupted median line, the interruptions of which coincide with the constrictions of the light stripe. Examined under a microscope it is seen that the enlargements of the dorsal light stripe are rhomboidal in form, but coalescent for about half their greatest width along the intersegmental lines, so that their margins form a continuous longitudinal serrate line. The dark color is confined to the space between the body folds and does not include the apices of the papillae, even in the darkest portions of the stripe. The median blackened line is discontinuous, passing over only five to seven folds on each segment and is much more strongly pigmented on the three or four alternate folds of each segmental group. The dorsal color-pattern fades out on the head and next segment, and continues to the posterior extremity of the body, although paler on the last two or three segments. The antennae are pale.

Integument. The integumentary folds are very narrow on the ridges with the transverse grooves between them deep. At the level of each leg two of the folds are incomplete, extending only about half-

way from the median line to the legs when seen in dorsal view. Examined in surface view the papillae appear to be practically all of the same type, large and rather transverse in outline. Seen by transmitted light, accessory papillae are few in number and always appear on the extreme edges of the folds singly or in pairs between two primary papillae, which are farther apart at the points where accessory ones are interpolated. The primary papillae are short-conical in form, with the terminal cylinder poorly developed, short, nipple-shaped; their bases are usually separated by nearly transverse grooves which give the papillae a somewhat rectangular appearance when viewed from above. The accessory ones tend to project over the groove between the body folds and are thus seen more or less in profile when the integument is viewed from above. In one specimen (Plate 1, fig. 1-2) where the skin is stretched from side to side the primary papillae are more widely separated and the accessory ones appear to be drawn up farther toward the ridges of the body folds.

Mandibles. The mandibles bear one large accessory tooth and nine denticles.

Legs. As stated above there are 33-34 pairs of legs in the females and 30 pairs in the single male examined. The legs are provided with three pedal papillae, two on the anterior face and one on the posterior face as in the Caribbean members of the genus. The creeping pads of each leg are composed of four bands. The nephridial tubercles on the fourth and fifth pairs of legs lie between the third and fourth bands of the creeping pad. They are free from the third band although lying partly in an emargination of its proximal margin, and do not disturb the continuity of the fourth band.

Type:—M. C. Z., No. 239, Cinnamati Coffee Plantation, near Santa Marta, Colombia, 2,300 feet. (Field No. 92).

Paratypes:—M. C. Z., No. 240; Univ. Mich. Same locality, 2,200 feet.

Named in honor of Amerigo Vespucci whose explorations led him along the coast which has yielded so many species of *Peripatus*.



Fig. 1.—*Peripatus (Epi-peripatus) vespuccii*. Outer blade of mandible.

In Bouvier's key this species will run down to *edwardsii*, but it is quite different from that species in the form and arrangement of the tegumentary papillae, and also possesses a larger number of legs in the female (33-34 pairs), *edwardsii* having only 30-32, rarely 33 in this sex. Were it not for the presence of incomplete body folds the structure of the integument would place it close to *brasiliensis*, although the specimens of *brasiliensis* figured by Bouvier have the primary papillae placed farther apart and the accessory ones ascend to the ridges of the folds. The structure of the fourth and fifth legs is as in *brasiliensis* also, with the nephridial tubercle entirely free from the third band of the creeping pad. It appears impossible, therefore, to associate the present form closely with any described species, although it undoubtedly falls near *edwardsii* while showing a striking similarity to *brasiliensis*. *Peripatus brasiliensis* was described from Santarem, but according to Bouvier probably extends to Panama; *P. edwardsii* occurs from French Guiana to Colombia. The present species is not closely related to any of the forms recently described by Fuhrmann (Zool. anz., 1913, 42, p. 241-248) from Colombia.

PERIPATUS (EPIPERIPATUS) EDWARDSII Blanchard.

Ann. sci. nat. Zool., 1847, sér. 3, 8, p. 140.

Of this widely distributed species there are nine specimens (Coll. Univ. Mich. and M. C. Z. No. 241-244), from the Cincinnati Coffee Plantation, near Santa Marta, Colombia.

As can be seen from the accompanying illustrations, there is considerable variation in the distribution of the integumentary papillae, particularly in the accessory ones. These latter vary much both in numbers and in distribution on the body folds, but the variation does not exceed that already observed by Bouvier in this species. All have the nephridial tubercles of the fourth and fifth legs free from the third creeping pad and the fourth pad is continuous. The number of legs is indicated in Table 2.

In the smaller specimens there is a marked difference in the size of the primary papillae which are alternately large with well-developed terminal cylinder and small with reduced cylinder. In these specimens the accessory papillae are sparse and restricted almost exclusively to the edges of the folds (Plate 2, fig. 7-8). The larger examples (Plate 2, fig. 6, 9) have the primary papillae of more nearly equal size and similar form and the accessory ones ascend more commonly on the sides of the folds although always remaining away from the ridges.

One unusually large specimen (Plate 2, fig. 5-6) has the periphery of the papillae unusually well defined by a series of irregular non-pigmented lines which form a noticeable network along the folds. It is possible that there may be one or more varietal or subspecific forms of *edwardsii* that might be distinguished. However, a close study of the material on hand, supplemented by other specimens in the M. C. Z. and in the American Museum of Natural History does not seem to offer any characters of sufficient constancy to warrant any such division.

TABLE 2.

Field number	Length of body		Greatest breadth	Number of legs
	Alive	Preserved		
50 (large)	72 mm.	50 mm.	Preserved 5.7 mm.	30 pairs
50 (small)	42 mm.	31 mm.	3.1 mm.	29 pairs
58	76 mm.	48 mm.	6 mm.	30 pairs
171-172	————	53 mm.	4.5 mm.	32 pairs
171-172	————	43 mm.	3.7 mm.	32 pairs
171-172	————	29 mm.	2.9 mm.	30 pairs
171-172	————	30 mm.	2.8 mm.	29 pairs
171-172	————	24 mm.	2 mm.	31 pairs
179	————	74 mm.	3.7 mm.	32 pairs

PERIPATUS (EPIPERIPATUS) IMTHURMI Sclater.

Quart. journ. micros. sci., 1888, 28, p. 474.

One specimen, No. 49 of the present collection (M. C. Z. No. 245), seems undoubtedly to belong to this species which has hitherto been reported only from Guiana. It is not very typical but agrees well

in the form and disposition of the papillae as well as in the character of the nephridial tubercle on the fourth and fifth legs. There are 30 pairs of legs, a common number for this species. In color, however, the specimen before me seems to differ somewhat from the normal color of *imthurmi* for according to Professor Pearse's field notes, it evidently showed in life lozenge-shaped markings. Bouvier has found in certain individuals indications of lozenges in addition to the median dark line, however, so that this variation is perhaps of not very great importance. The specimen was fixed in Gilson's fluid and it is impossible at present to see any indications of the original color-pattern.

The present record greatly extends the range of *imthurmi*, but after a long series of comparisons I am convinced that it is either a non-typical or varietal form of *imthurmi*. The single female is from the Cincinnati Coffee Plantation, altitude about 3,000 ft., 18 miles south of Santa Marta, Colombia.

Field Notes and Observations. BY A. S. PEARSE. All specimens are from the Cincinnati Coffee plantation, 18 miles south of Santa Marta, Colombia. The field numbers are those referred to in the preceding taxonomic account.

49. One *Peripatus*, in a log $30 \times 1\frac{1}{2}$ ft. on a hillside southeast of the Plantation. Altitude about 3,000 feet. July 7, 1913.
50. Two *Peripatus*, same as 49 per locality and date, in a small stump $1\frac{1}{2}$ ft. high and 5 inches in diameter, with borers (*Passalus*, etc.) imagoes, larvae, and pupae.
58. *Peripatus* in a rotten log with one beetle, isopods, ants, etc. Altitude about 5,300 feet. July 8, 1913.

This log, like the others I had examined up to this time which contained *Peripatus*, was on an open hillside exposed to the sun, with *Pteris* growing all around. I found a cricket in this log which was fastened by its dorsal surface by a sticky secretion.

92. *Peripatus* on the trail toward Minca below the Plantation. Under bark on a live tree about $3\frac{1}{2}$ feet above the ground in a rather dry, dense forest. Altitude about 2,300 feet. July 15, 1913.
151. Small *Peripatus* in the forest southwest of the Plantation, under leaves. Altitude about 2,200 feet. Died before being preserved. July 21, 1913.
152. *Peripatus* in the centre of a very soft log which could be torn apart with the hands. Same locality and date as 151.
171. Two small *Peripatus* beside the trail under the bark of a rather firm log which had been bored by beetles. The bodies of these

two animals were in contact when taken. On the trail toward Minca below the Plantation in forest. Log exposed to full rays of sun. Altitude about 2,100 feet. July 24, 1913.

172. Three *Peripatus*, same locality as last, one under the bark of a log, two in cavities made by beetles in log.
179. *Peripatus* under log in forest southwest of the Plantation. Altitude about 2,200 feet. July 25, 1913.

Locomotion. They crawl backward as well as forward, and may use one, two, three, four, five, or six pairs of legs at the anterior end alternately, but may use all pairs of legs together. I placed several in a big white developing tray. They often crawled away from the light, though they frequently went toward it, or without reference to it. Often when they came to the edge of the dish, or sometimes when a card was held between them and the light, they raised the anterior end and waved it about. The last or last two pairs of legs are usually not used in walking but are held quiet above the substratum upon which the animal moves. Often the first three pairs of legs are thus held immobile.

I put Nos. 58 and 50 (large) in a vial with a beetle larva, a silver fish, and a milliped. Although these crawled over the *Peripatus* it did not shoot out any white threads. I pinched No. 50 (small); it turned its anterior end and shot out a colorless secretion which stuck to the forceps and fastened the myriopod to the tray so that it could not escape. I pinched No. 50 (large), and it gave out a colorless, rather viscid secretion from two ventral lateral papillae on the under side of the head. This secretion fastened the beetle larva to the bottom of the tray, but it soon hardened so that it was not sticky. I pinched it again. The head was turned back and the secretion shot out for a distance of about 2 cm. It formed a reticulate network on the back of the *Peripatus* and stuck it to my forceps. The *Peripatus* was unable to free itself from the forceps for an hour, when I released it.

On a later day I squeezed a *Peripatus* and induced it to throw threads from the bases of several of the legs behind the head.

Note on a Collection of Peripatus from Trinidad and Grenada. During a visit to Grenada and Trinidad during the winter of 1912-13, Prof. Roland Thaxter secured a very extensive collection of *Peripatus* from these islands, which he has given to the Museum of Comparative Zoölogy. Though unsuccessful in collecting further specimens of *Peripatus barbouri* Brues, a species peculiar to the high portion of Grenada, he obtained a single small specimen, (M. C. Z. No. 199), of

Peripatus collected by Mr. G. Whitfield Smith on the Island of Carriacou. This is quite different from the Grenada species, but it is impossible to identify it with certainty from the unique, evidently immature specimen. Although Carriacou is within sight of the northern coast of Grenada, it lies rather low and its comparatively dry climate is in great contrast to the very moist region in the higher mountains of Grenada where *P. barbouri* occurs.

In Trinidad Professor Thaxter obtained fine series of both species hitherto known from that island; six males and seven females (M. C. Z. No. 201-208, 211-214, 217), of *P. (Epi-peripatus) trinidadensis* Sedgwick, and two males and four females (M. C. Z. No. 209-210, 215-216, 218-219), of *P. (Macroperipatus) torquatus* von Kennel. In addition there is a single female (M. C. Z. No. 200), measuring 88 mm. in length with 31 pairs of legs belonging to *P. (Epi-peripatus) imthurmi*, a species hitherto known only from the mainland of South America.